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for Automotive and Motorsport

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PDUX3B-AS
Datasheet

The PDUX3B-AS is a high-performance solid-state power distribution unit with a total of 34 powered output channels and maximum current capacity of 350A.

This includes ten flexible 25A output drivers with soft start (half-bridge, high side or high side PWM at a configurable frequency); two 25A output drivers with soft start (high side and high side PWM at a configurable frequency) and seven 25A output drivers (high side).

In addition, there are nine 15A output drivers with soft start (high side or high side PWM at a configurable frequency) and six 15A output drivers (high side).

Using digitised, voltage, or linearised values from its 16 analogue inputs and from any of three CAN buses, the PDUX3B-AS is calibrated using a clear graphical interface with full logic simulation and live monitoring capabilities.

The PDUX3B-AS is able to operate in a low-power standby state, drawing <2mA, with configurable activation based on physical or CAN input.

Additionally, the PDUX3B-AS may be used to expand input and output functionality of any Life Racing ECU.

Features:

- Schematic based calibration including logic simulation tool.
- Custom CAN across 3 buses including mux frames and retransmission (gateway) features, configured with a graphical display and import/export tool.
- Low power state woken on either a physical input, CAN activity or specific CAN frame
- Configurable evaluation frequency operation of schematic components in circuitry – "Expert Frequency Mode"
- Optional internal IMU (Inertial Measurement Unit) feature offers a six-axis gyro and accelerometer which can be processed internally or transmitted over CAN.

Outputs:

- 34 main power outputs:
  - 10 multifunction outputs configurable as either half-bridge, high side, low side, high side PWM (100Hz-20kHz) outputs.
    (25A continuous, soft-start inrush limiting 60A, hard-start inrush 60A)
  - 9 high side, two of which can be high side PWM (100Hz-20kHz) outputs.
    (25A continuous, hard-start inrush 60A)
  - 15 high side, nine of which can be high side PWM (100Hz-20kHz) outputs.
    (15A continuous, hard-start inrush 30A)
- Output linking ('teaming') to support very high current devices.
- Four additional low side outputs with configurable PWM (10Hz-10kHz, 5A maximum).
- All outputs short circuit and thermally protected with multi-stage in-rush control.
- All outputs additionally protected by physical fuses as required by worldwide regulations.
- Combined diagnostic output with reset input.
- 128 scalable CAN ('soft') outputs.
- Custom CAN datastream – i.e., customisable channel current, channel state and device information

Inputs:

- 16 physical 0-5V inputs, including software selectable 3k Ohm pull-up resistors.
- Four inputs capable of programmable "wake" functionality.
- Comparing and manipulating real numbers (floating point decimal) in schematic using configurable logic blocks.
- Analogue inputs can be linearised, viewed as raw voltage or Boolean values.
- Dedicated wake pin.
- 128 CAN 'soft' inputs with configurable scaling.

Interfaces:

- 2x 100Mbit/s full duplex Ethernet (Ethernet switch functionality).
- 3x CAN 2.0B – fully flexible.
- Option for one galvanically isolated CAN bus *(CAN3 - custom projects only).*
- RS232C serial interface *(custom projects only).*
- LIN Bus *(custom projects only).*

Power Supply:

- 6V to 20V input voltage (12V).
- Dedicated logic power input.
- Regulated 5V sensor supply output with full circuit protection.

Sleep State:

- Low power standby state with configurable wake options:
  - Wake by voltage signal (1.6mA).
  - Wake by any CAN activity (CAN-1 only) (2mA).
  - Wake by specific CAN frame or content (two frames required, CAN-1 only) (2mA).
  - Wake by specific CAN frame or content with low latency (one frame required, CAN-1 only) (10mA).

ECU Slaving:

- Allows a Life Racing ECU to "claim" unused pins across a dedicated CAN bus utilising the following PDU I/O:
  - Outputs 1-10 with additional functionality including full-bridge pairing and configurable PWM frequencies.
  - Low outputs 11-14 with configurable PWM frequencies and internal pull up resistors.
  - All 16 inputs, including eight frequency capable (four optionally bipolar), and all with software selectable 3k Ohm pull-up resistors.

Physical:

- Three Autosport connectors with a total of 122 pins.
- Amphenol SurLok power stud.
- Machined Aluminium enclosure.
- 210x130x52mm
- 1090 grams.
- Operating Temperature -40°C to +85°C.
- M4 mounting threads.

Ordering Information:

Description	Part number
PDUX3B-AS 350A (10mm main power stud)	PDU-H01
PDUX3B-AS 200A (8mm main power stud)	PDU-H04
PDUX4B-AS 350A (10mm main power stud)	PDU-H02
PDUX4B-AS 200A (8mm main power stud)	PDU-H05
PDUX 350A Connector Kit	CON-A18
PDUX 200A Connector Kit	CON-A17
3-axis accelerometer and 3-axis gyroscope	PDU-FEAT-IMU
Two pin wheel speed sensor inputs	PDU-BTC-WS

Wiring Information:

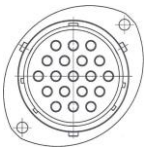
Power Stud

Mating connector (350A): Surlok SLPPCxxBSR
Mating connector (200A): Surlok SLPPBxxBSR
(xx=size: 35 150A, 50 200A, 70 300A, 85 350A)

Pin	Gauge	Signal Name	Signal Notes
1	-	+12V Supply	Positive battery supply

Connector 1:

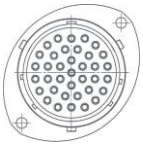
Mating connector: 8STA6-24-19PN



Pin	Gauge	Signal Name	Signal Notes
A	12AWG	Output 1	High Side/Low Side/High Side PWM (configurable Hz), Soft start 25A(1) SLAVED: Half Bridge, Full Bridge paired with Output 1, Low Side, PWM
B	12AWG	Output 12	High Side/High Side PWM (configurable Hz), Soft start, 25A
C	12AWG	Output 11	High Side/High Side PWM (configurable Hz), Soft start, 25A
D	12AWG	Output 10	High Side/Low Side/High Side PWM (configurable Hz), Soft start 25A(1) SLAVED: Half Bridge, Full Bridge paired with Output 1, Low Side, PWM
E	12AWG	Output 9	High Side/Low Side/High Side PWM (configurable Hz), Soft start 25A(1) SLAVED: Half Bridge, Full Bridge paired with Output 1, Low Side, PWM
F	12AWG	Output 8	High Side/Low Side/High Side PWM (configurable Hz), Soft start 25A(1) SLAVED: Half Bridge, Full Bridge paired with Output 1, Low Side, PWM
G	12AWG	Output 7	High Side/Low Side/High Side PWM (configurable Hz), Soft start 25A(1) SLAVED: Half Bridge, Full Bridge paired with Output 1, Low Side, PWM
H	12AWG	Output 6	High Side/Low Side/High Side PWM (configurable Hz), Soft start 25A(1) SLAVED: Half Bridge, Full Bridge paired with Output 1, Low Side, PWM
J	12AWG	Output 5	High Side/Low Side/High Side PWM (configurable Hz), Soft start 25A(1) SLAVED: Half Bridge, Full Bridge paired with Output 1, Low Side, PWM
K	12AWG	Output 4	High Side/Low Side/High Side PWM (configurable Hz), Soft start 25A(1) SLAVED: Half Bridge, Full Bridge paired with Output 1, Low Side, PWM
L	12AWG	Output 3	High Side/Low Side/High Side PWM (configurable Hz), Soft start 25A(1) SLAVED: Half Bridge, Full Bridge paired with Output 1, Low Side, PWM
M	12AWG	Output 2	High Side/Low Side/High Side PWM (configurable Hz), Soft start 25A(1) SLAVED: Half Bridge, Full Bridge paired with Output 1, Low Side, PWM
N	12AWG	Output 14	High Side 25A
P	12AWG	Output 13	High Side 25A
R	12AWG	Output 18	High Side 25A
S	12AWG	Output 17	High Side 25A
T	12AWG	Output 16	High Side 25A
U	12AWG	Output 15	High Side 25A
V	12AWG	Output 19	High Side 25A

Connector 2:

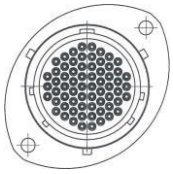
Mating Connector: 8STA6-24-37PN



Pin	Gauge	Signal Name	Signal Notes
A	16AWG	Output 20	High Side, High Side PWM (configurable Hz), Soft Start, 15A(2)
B	16AWG	DO NOT USE	DO NOT USE
C	16AWG	DO NOT USE	DO NOT USE
D	16AWG	DO NOT USE	DO NOT USE
E	16AWG	Output 34	High Side 15A
F	16AWG	Output 33	High Side 15A
G	16AWG	Output 32	High Side 15A
H	16AWG	Output 31	High Side 15A
J	16AWG	Output 30	High Side 15A
K	16AWG	Output 29	High Side 15A
L	16AWG	Output 28	High Side, High Side PWM (configurable Hz), Soft Start, 15A(2)
M	16AWG	Output 27	High Side, High Side PWM (configurable Hz), Soft Start, 15A(2)
N	16AWG	Output 26	High Side, High Side PWM (configurable Hz), Soft Start, 15A(2)
P	16AWG	Output 25	High Side, High Side PWM (configurable Hz), Soft Start, 15A(2)
R	16AWG	Output 24	High Side, High Side PWM (configurable Hz), Soft Start, 15A(2)
S	16AWG	Output 23	High Side, High Side PWM (configurable Hz), Soft Start, 15A(2)
T	16AWG	Output 22	High Side, High Side PWM (configurable Hz), Soft Start, 15A(2)
U	16AWG	Output 21	High Side, High Side PWM (configurable Hz), Soft Start, 15A(2)
V	16AWG	Output 21D	Duplicate of output 21 with Diode - intended for wiper operation 15A
W	16AWG	DO NOT USE	DO NOT USE
X	16AWG	DO NOT USE	DO NOT USE
Y	16AWG	DO NOT USE	DO NOT USE
Z	16AWG	DO NOT USE	DO NOT USE
a	16AWG	DO NOT USE	DO NOT USE
b	16AWG	DO NOT USE	DO NOT USE
c	16AWG	DO NOT USE	DO NOT USE
d	16AWG	DO NOT USE	DO NOT USE
e	16AWG	DO NOT USE	DO NOT USE
f	16AWG	DO NOT USE	DO NOT USE
g	16AWG	DO NOT USE	DO NOT USE
h	16AWG	DO NOT USE	DO NOT USE
k	16AWG	POWER GROUND	Negative battery supply. Must be connected
m	16AWG	POWER GROUND	Negative battery supply. Must be connected
n	16AWG	POWER GROUND	Negative battery supply. Must be connected
p	16AWG	POWER GROUND	Negative battery supply. Must be connected
q	16AWG	POWER GROUND	Negative battery supply. Must be connected
r	16AWG	POWER GROUND	Negative battery supply. Must be connected

Connector 3:

Mating Connector: 8STA6-18-35SN



Pin	Gauge	Signal Name	Signal Notes
1	24-16AWG	INPUT #01	Analogue 0-5V, 3kΩ programmable pullup to 5V SLAVED: Analogue or frequency; 0-5V, -5V to +5V, 3kΩ programmable pullup to 5V, configurable frequency voltage thresholds
2	24-16AWG	INPUT #02	Analogue 0-5V, 3kΩ programmable pullup to 5V SLAVED: Analogue or frequency; 0-5V, -5V to +5V, 3kΩ programmable pullup to 5V, configurable frequency voltage thresholds
3	24-16AWG	INPUT #03	Analogue 0-5V, 3kΩ programmable pullup to 5V SLAVED: Analogue or frequency; 0-5V, -5V to +5V, 3kΩ programmable pullup to 5V, configurable frequency voltage thresholds
4	24-16AWG	INPUT #04	Analogue 0-5V, 3kΩ programmable pullup to 5V SLAVED: Analogue or frequency; 0-5V, -5V to +5V, 3kΩ programmable pullup to 5V, configurable frequency voltage thresholds
5	24-16AWG	INPUT #05	Analogue 0-5V, 3kΩ programmable pullup to 5V SLAVED: Analogue or frequency; 0-5V, 3kΩ programmable pullup to 5V Fixed frequency voltage thresholds at 1.25 and 3.75V
6	24-16AWG	INPUT #06	Analogue 0-5V, 3kΩ programmable pullup to 5V SLAVED: Analogue or frequency; 0-5V, 3kΩ programmable pullup to 5V Fixed frequency voltage thresholds at 1.25 and 3.75V
7	24-16AWG	INPUT #07	Analogue 0-5V, 3kΩ programmable pullup to 5V SLAVED: Analogue or frequency; 0-5V, 3kΩ programmable pullup to 5V Fixed frequency voltage thresholds at 1.25 and 3.75V
8	24-16AWG	INPUT #08	Analogue 0-5V, 3kΩ programmable pullup to 5V SLAVED: Analogue or frequency; 0-5V, 3kΩ programmable pullup to 5V Fixed frequency voltage thresholds at 1.25 and 3.75V
9	24-16AWG	INPUT #09	Analogue 0-5V, 3kΩ programmable pullup to 5V
10	24-16AWG	INPUT #10	Analogue 0-5V, 3kΩ programmable pullup to 5V
11	24-16AWG	INPUT #11	Analogue 0-5V, 3kΩ programmable pullup to 5V
12	24-16AWG	INPUT #12	Analogue 0-5V, 3kΩ programmable pullup to 5V
13	24-16AWG	INPUT #13	Analogue 0-5V, 3kΩ programmable pullup to 5V, Wake(4)
14	24-16AWG	INPUT #14	Analogue 0-5V, 3kΩ programmable pullup to 5V, Wake(4)
15	24-16AWG	INPUT #15	Analogue 0-5V, 3kΩ programmable pullup to 5V, Wake(4)
16	24-16AWG	INPUT #16	Analogue 0-5V, 3kΩ programmable pullup to 5V, Wake(4)
17	24-16AWG	SENSOR GND	Sensor ground
18	24-16AWG	SENSOR GND	Sensor ground
19	24-16AWG	WAKEUP	Dedicated Wake(4)
20	24-16AWG	5V OUT	Regulated 5V sensor supply rail
21	24-16AWG	CAN #03 HI	CAN communication port 120Ω software selectable termination
22	24-16AWG	CAN #03 LO	CAN communication port 120Ω software selectable termination
23	24-16AWG	CAN #02 HI	CAN communication port 120Ω software selectable termination
24	24-16AWG	CAN #02 LO	CAN communication port 120Ω software selectable termination
25	24-16AWG	LOGIC POWER IN	+12V Battery supply; recommended independent logic supply <0.5A
26	24-16AWG	Low Output 11	Low Side, Low Side PWM (configurable Hz, 5A maximum)(3)
27	24-16AWG	Low Output 12	Low Side, Low Side PWM (configurable Hz, 5A maximum)(3)
28	24-16AWG	Low Output 13	Low Side, Low Side PWM (configurable Hz, 5A maximum)(3)
29	24-16AWG	Low Output 14	Low Side, Low Side PWM (configurable Hz, 5A maximum)(3)
30	24-16AWG	ETHERNET2 RX+	Ethernet communication port 2
31	24-16AWG	ETHERNET2 RX-	Ethernet communication port 2
32	24-16AWG	ETHERNET2 TX+	Ethernet communication port 2
33	24-16AWG	ETHERNET2 TX-	Ethernet communication port 2
34	24-16AWG	DO NOT USE	DO NOT USE
35	24-16AWG	LIN	

Connector 3

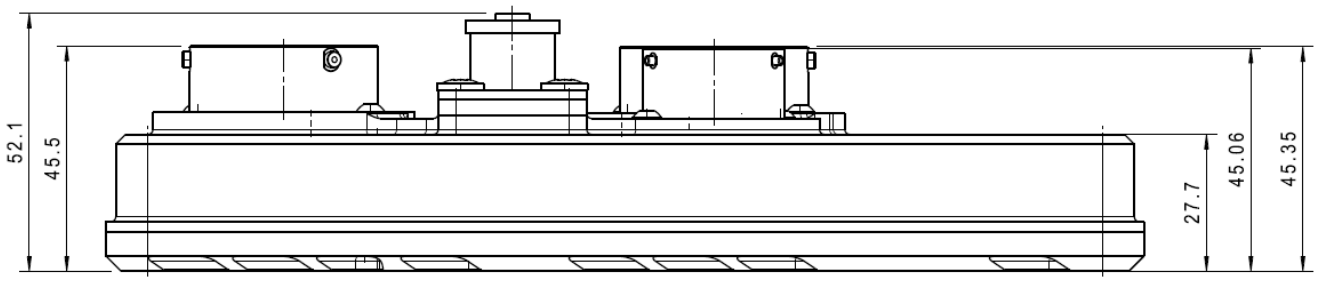
Continued...

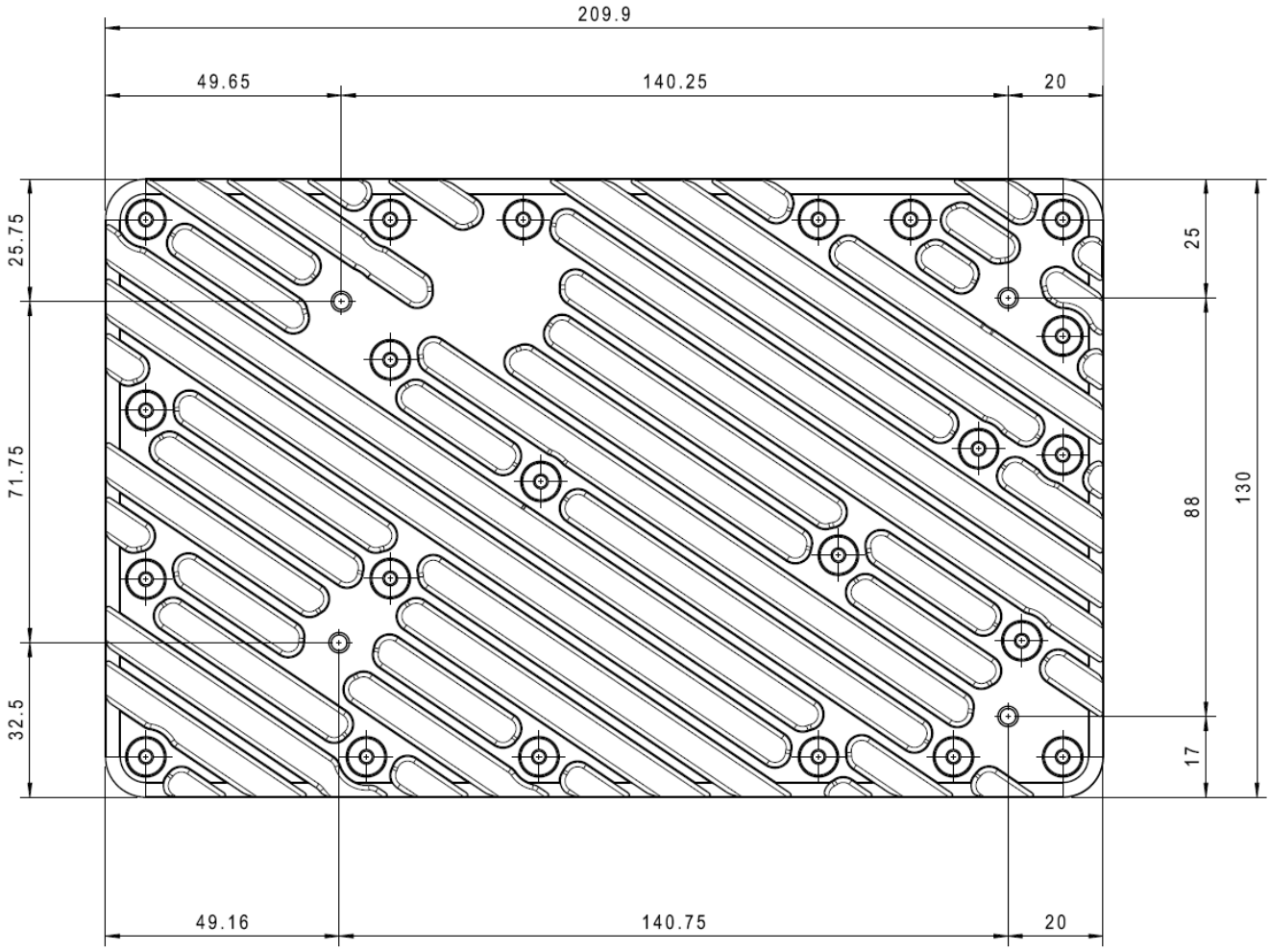
Pin	Gauge	Signal Name	Signal Notes
36	24-16AWG	WARNING AND RESET SW	Warning output for an LED to ground. Short to ground for manual reset.
37	24-16AWG	SENSOR GND	Sensor ground
38	24-16AWG	SENSOR GND	Sensor ground
39	24-16AWG	ETHERNET1 RX+	Ethernet communication port 1
40	24-16AWG	ETHERNET1 RX-	Ethernet communication port 1
41	24-16AWG	ETHERNET1 TX+	Ethernet communication port 1
42	24-16AWG	ETHERNET1 TX-	Ethernet communication port 1
43	24-16AWG	RS232 TX	RS232 transmit (Custom Projects Only)
44	24-16AWG	RS232 RX	RS232 receive (Custom Projects Only)
45	24-16AWG	CAN #01 HI	CAN communication port 120Ω software selectable termination
46	24-16AWG	CAN #01 LO	CAN communication port 120Ω software selectable termination
47	24-16AWG	DO NOT USE	DO NOT USE
48	24-16AWG	DO NOT USE	DO NOT USE
49	24-16AWG	DO NOT USE	DO NOT USE
50	24-16AWG	DO NOT USE	DO NOT USE
51	24-16AWG	DO NOT USE	DO NOT USE
52	24-16AWG	DO NOT USE	DO NOT USE
53	24-16AWG	DO NOT USE	DO NOT USE
54	24-16AWG	DO NOT USE	DO NOT USE
55	24-16AWG	DO NOT USE	DO NOT USE
56	24-16AWG	DO NOT USE	DO NOT USE
57	24-16AWG	DO NOT USE	DO NOT USE
58	24-16AWG	DO NOT USE	DO NOT USE
59	24-16AWG	DO NOT USE	DO NOT USE
60	24-16AWG	DO NOT USE	DO NOT USE
61	24-16AWG	DO NOT USE	DO NOT USE
62	24-16AWG	DO NOT USE	DO NOT USE
63	24-16AWG	DO NOT USE	DO NOT USE
64	24-16AWG	DO NOT USE	DO NOT USE
65	24-16AWG	DO NOT USE	DO NOT USE
66	24-16AWG	DO NOT USE	DO NOT USE

Footnotes:

[1]Default PWM frequency for Outputs 1-12 is 20kHz.
[2]Default PWM frequency for Outputs 21-28 is 20kHz.
[3]Default PWM frequency for Low Side Outputs 11-14 is 125Hz.
[4]Can be calibrated to bring unit out of sleep mode.

Dimensions:





Warranty and Servicing:

- One-year limited warranty when used within supplied specification.